2.4 Environmental Occurrences

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Onsite and offsite environmental releases of radioactive and regulated materials are reported to DOE and other federal and state agencies as required by law. The specific agencies notified depend on the type, amount, and location of the individual occurrences. In some cases, an occurrence may be under continuing observation and evaluation. All emergency, unusual, and off-normal occurrences at the Hanford Site are reported to the Hanford Site Occurrence Notification Center. This center is responsible for maintaining both a computer database and a hard-copy file of event descriptions and corrective actions. Copies of occurrence reports are made available for public review in the DOE's Hanford Reading Room located in the Consolidated Information Center on the campus of Washington State University at Tri-Cities, Richland, Washington. The following sections summarize some of the emergency and off-normal environmental occurrences not previously discussed or that were not discussed in detail. For each occurrence, the title and report number from the Hanford Site Occurrence Notification Center is given in the heading.

2.4.1 Emergency Occurrences

As defined in DOE Order 232.1A, emergency occurrences "are the most serious occurrences and require an increased alert status for onsite personnel and, in specified cases, for offsite authorities." There were no emergency occurrence reports filed in 1999.

2.4.2 Unusual Occurrences

An unusual occurrence is defined in the DOE Order as "a non-emergency occurrence that exceeds the Off-Normal Occurrence threshold criteria, is related to safety, environment, health, security, or operations, and requires immediate notification to DOE." There was one environmentally significant unusual occurrence report filed during 1999.

- Contaminated Shipping Cask (RL-PHMC-SNF-1999-0013)

On May 12, 1999, a Chem-Nuclear shipping cask was transported from the 100-K Area to Chem-Nuclear Systems in Barnwell, South Carolina. The pre-shipment surveys indicated that external contamination levels were within U.S. Department of Transportation allowable shipment limits. Upon receipt in Barnwell on May 20, 1999, the cask protective overpack was removed and smear samples were taken on the cask body and base plate. These smears indicated areas where the contamination limit of 22,000 disintegrations per minute/100 cm^2 (beta/gamma, no alpha) was exceeded. An investigation found that the contamination leached from the outer surface of the cask following immersion of the cask in the 105-K East Basin prior to shipping. In the future, this type of shipping cask will not be used, and the shipping procedure for this cask has been cancelled.

2.4.3 Off-Normal Occurrences

Off-normal environmental occurrences are classified in the DOE Order as "abnormal or unplanned events or conditions that adversely affect, potentially affect, or are indicative of degradation in the safety, safeguards and security, environmental or health protection, performance or operation of a facility." Several of these occurrences and the results of state and federal inspections are discussed in Section 2.2.6.4, "RCRA Inspections," and Section 2.2.8, "Clean Water Act."

Three environmentally related off-normal occurrences took place in 1999, and one potential exposure of workers to beryllium was reported.

- Chlorine Gas Leak at the 283-East Water Plant (RL-PHMC-S&W-1999-0002)

On March 25, 1999, an alarm indicating high chlorine levels activated in the chlorine injector room during activities to restart the potable water system at the 283-East Water Plant. Momentary over-pressurization of the chlorine injector system can occur during startup and the chlorine is vented to the outdoors through a vent pipe. However, the vent pipe was broken and this allowed the gas to vent into the chlorine injector room. Within 45 minutes of the alarm, chlorine gas was no longer detectable in the chlorine injector room. However, 0.6 parts per million chlorine was detected in the lower level pump room. Personnel were not injured as a result of this event; however, seven personnel who reported smelling chlorine gas were taken to the Hanford Environmental Health Foundation for evaluation. All personnel were examined and returned to work with no noted medical conditions or deficiencies from this event. The preventative maintenance plan was modified to include periodic replacement of the vent pipe because the chlorine gas could cause the pipe to become brittle.

- Potential Exposure to Beryllium Contamination (RL-PNNLBOPER-1999-0010)

In mid-March 1999, three beryllium sample holders for x-ray and scanning electron microscopy were cut into sections using a wet-cutting technique. Potential hazards were identified during cleanup operations at the conclusion of work on April 13, 1999. Fourteen smear samples were taken in the work area, with five locations at or above the Hanford release limit. Several staff members were potentially exposed to beryllium because of this incident. Corrective actions taken included a recovery plan for laboratory cleanup and disposal of beryllium contamination, notifications to staff who were potentially exposed, discussions of possible beryllium health issues and monitoring, and modification to procedures and management controls related to work activities involving potentially hazardous materials.

- A Fire Alarm Results in a Halon® 1301 Discharge to Gloveboxes in Building 234-5Z (200-West Area) (RL-PHMC-PFP-1999-0031)

On July 28, 1999, a fire alarm activated in zone 46 in building 234-5Z (200-West Area). This resulted in the release of ~154 kilograms (340 pounds) of Halon® 1301 into the gloveboxes located in this zone. All personnel immediately evacuated the building. The Hanford Fire Department responded and determined that no fire existed in the affected area. Two operators in the area at the time of the fire alarm were sent to the Hanford Environmental Health Foundation as a precautionary measure for follow-up medical evaluation. No adverse health affects were expected as a result of this occurrence. The cause of the fire alarm was determined to be a broken fire alarm manual pull box. Halon® 1301 is a fairly nontoxic chemical but is hazardous in high concentrations because it displaces oxygen. In addition, Halon® 1301 is an ozone-depleting compound, and accidental releases should be minimized.

- Range Fire in a Soil Contamination Area in the BC Control Area (RL-BHI-IFSM-1999-0005)

On July 16, 1999, the Hanford Patrol Operations Center was notified of a range fire between Route 4-South (milepost 5) and Army Loop Road on the Hanford Site. The fire was in the BC cribs control area, which is posted as a soil contamination area. The Hanford Fire Department was dispatched and estimated the fire at 1 to 2 hectares (3 to 5 acres). The fire crew entered the soil contamination area and extinguished the fire in ~40 minutes using portable equipment. The cause of the fire was determined to be a lightning strike. Upon exiting the soil contamination area, the equipment was surveyed and no contamination was detected. The ground was largely undisturbed during the firefighting efforts, and no radiological release was detected.